

AMENDMENTS TO THE CLAIMS

Claim 1 (Currently Amended): A method of treating a dielectric film comprising:
exposing at least one surface of said dielectric film to a C_xH_y containing material,
wherein: where x and y are each integers greater than or equal to a value of unity [[,]] ; and
exposing said at least one surface of said dielectric film to a chlorine containing
material, wherein
said dielectric film has a dielectric constant value less than the dielectric constant of
SiO₂.

Claim 2 (Currently Amended): The method of claim 1, further comprising:
exposing said at least one surface of said dielectric film to ~~at least one of~~ a nitrogen
containing material ~~and a chlorine containing material.~~

Claim 3 (Original): The method of claim 1, wherein said exposing said dielectric film
comprises exposing a dielectric film having a dielectric constant ranging from 1.6 to 2.7.

Claim 4 (Currently Amended): The method of claim 1, wherein said exposing said
dielectric film comprises exposing ~~at least one of~~ a porous dielectric film, ~~and a non-porous~~
~~dielectric film.~~

Claim 5 (Currently Amended): The method of claim 1, wherein said exposing said
~~porous~~ dielectric film comprises exposing at least one of a single-phase material, and a dual-
phase material.

Claim 6 (Original): The method of claim 1, wherein said exposing said dielectric film comprises exposing a film including at least one of an organic material, and an inorganic material.

Claim 7 (Original): The method of claim 6, wherein said exposing a film comprises exposing a film including an inorganic-organic hybrid material.

Claim 8 (Original): The method of claim 6, wherein said exposing a film comprises exposing a film including an oxidized organo silane.

Claim 9 (Original): The method of claim 6, wherein said exposing a film comprises exposing a film including at least one of hydrogen silsesquioxane, and methyl silsesquioxane.

Claim 10 (Original): The method of claim 6, wherein said exposing a film comprises exposing a film including a silicate-based material.

Claim 11 (Original): The method of claim 6, wherein said exposing a film comprises exposing a collective film including silicon, carbon, and oxygen.

Claim 12 (Original): The method of claim 11, wherein said exposing a collective film further comprises exposing hydrogen in said collective film.

Claim 13 (Currently Amended): The method of claim 1, wherein said exposing said dielectric film to said C_xH_y containing material comprises introducing said C_xH_y containing material in within at least one of a vapor phase, a liquid phase, and within a supercritical fluid.

Claim 14 (Currently Amended): The method of claim 13, wherein
said introducing said C_xH_y containing material within said supercritical fluid
comprises introducing said C_xH_y containing material said exposing said dielectric film to said
C_xH_y containing material comprises introducing said C_xH_y containing material within
supercritical carbon dioxide.

Claim 15 (Original): The method of claims 1 or 2, wherein said exposing said dielectric film to said C_xH_y containing material comprises exposing said dielectric film to at least one of a CH₂ containing material, and a CH₃ containing material.

Claim 16 (Original): The method of claim 1, wherein said exposing said dielectric film to said C_xH_y containing material comprises exposing said dielectric film to at least one of TMCTS, and OMCTS.

Claim 17 (Original): The method of claim 2, wherein said exposing said dielectric film to said C_xH_y containing material comprises exposing said dielectric film to at least one of hexamethyldisilazane (HMDS), trimethyldisilazane (TMDS), chlorotrimethylsilane (TMCS), trichloromethylsilane (TCMS), [C₆H₅Si(CH₃)₂]₂NH, C₁₅H₂₉NSi, (CH₃)₂NH Dimethylamine, and H₂N(CH₂)₃Si(OC₂H₅)₃ 3-Aminopropyltriethoxysilane.

Claim 18 (Original): The method of claim 1, further comprising:

heating said dielectric film on said substrate to a temperature ranging from 50C to 400C.

Claim 19 (Original): The method of claims 1 or 2, wherein exposing said dielectric film to said C_xH_y containing material facilitates at least one of healing said dielectric film, sealing said dielectric film, and cleaning said dielectric film.

Claim 20 (Original): The method of claim 1, wherein said exposing at least one surface of said dielectric film to said C_xH_y containing material comprises exposing said at least one surface of said dielectric film to a first C_xH_y containing material, and to a second C_xH_y containing material.

Claim 21 (Currently Amended): A method of producing a dielectric film on a substrate comprising:

forming said dielectric film on said substrate;
forming a mask on said dielectric film;
forming a pattern in said mask;
forming at least one feature in said dielectric film by transferring said pattern in said mask to said dielectric film; and
exposing a sidewall of said feature in said dielectric film to a treating compound,

wherein

said treating compound comprises
a C_xH_y containing material, wherein where x and y are each integers greater than or equal to unity, and
a Cl-containing material.

Claim 22 (Currently Amended): The method of claim 21, further comprising:
~~exposing said sidewall of said feature to said treating compound;~~ wherein said treating compound further comprises ~~at least one of a N-containing material and a Cl-containing material.~~

Claim 23 (Original): The method of claims 21 or 22, further comprising:
heating said dielectric film on said substrate to a temperature ranging from 50C to 400C.

Claim 24 (Original): The method of claims 21 or 22, wherein said exposing said sidewall of said feature to said C_xH_y containing material comprises exposing said sidewall of said feature to at least one of a CH₂ containing material, and a CH₃ containing material.

Claim 25 (Original): The method of claim 21, wherein said exposing said sidewall of said feature to said C_xH_y containing material comprises exposing said sidewall of said feature to at least one of TMCTS, and OMCTS.

Claim 26 (Currently Amended): The method of claim 22, wherein said exposing said sidewall of said feature in said dielectric film to said healing treating compound comprises exposing said dielectric film to at least one of hexamethyldisilazane (HMDS), trimethyldisilazane (TMDS), chlorotrimethylsilane (TMCS), trichloromethylsilane (TCMS), [C₆H₅Si(CH₃)₂]₂NH, C₁₅H₂₉NSi, (CH₃)₂NH Dimethylamine, and H₂N(CH₂)₃Si(OC₂H₅)₃ 3-Aminopropyltriethoxysilane.

Claim 27 (Currently Amended): A method of treating a dielectric film comprising exposing said dielectric film at a temperature ranging from 50C to 400C to a treating compound, wherein said treating compound comprises a C_xH_y containing material, wherein where x and y are each integers greater than or equal to unity.

Claim 28 (Currently Amended): The method of claim 27, further comprising: ~~exposing said dielectric film to said treating compound,~~ wherein said treating compound further comprise comprises at least one of a N-containing material and a Cl-containing material.

Claim 29 (Original): The method of claims 27 or 28, wherein exposing said dielectric film to said treating compound facilitates at least one of healing said dielectric film, sealing said dielectric film, and cleaning said dielectric film.

Claims 30-48 (Canceled)

Claim 49 (New): The method of claim 1, wherein said exposing said dielectric film comprises exposing a non-porous dielectric film.

Claim 50 (New) A method of treating a dielectric film comprising:
exposing at least one surface of said dielectric film at a temperature ranging from 50C to 400C to a C_xH_y containing material, where x and y are each integers greater than or equal to a value of unity, wherein
said dielectric film has a dielectric constant value less than the dielectric constant of SiO₂.

Claim 51 (New): A method of producing a dielectric film on a substrate comprising:

- forming said dielectric film on said substrate;
- forming a mask on said dielectric film;
- forming a pattern in said mask;
- forming at least one feature in said dielectric film by transferring said pattern in said mask to said dielectric film; and
- exposing a sidewall of said feature in said dielectric film at a temperature ranging from 50C to 400C to a treating compound, wherein
- said treating compound comprises a C_xH_y containing material, where x and y are each integers greater than or equal to unity.

Claim 52 (New): A method of treating a dielectric film comprising:

- exposing at least one surface of said dielectric film to at least one of TMCTS and OMCTS, wherein
- said dielectric film has a dielectric constant value less than the dielectric constant of SiO_2 .

Claim 53 (New): A method of treating a dielectric film comprising:

- exposing at least one surface of said dielectric film to a C_xH_y containing material, where x and y are each integers greater than or equal to a value of unity; and
- said dielectric film has a dielectric constant value less than the dielectric constant of SiO_2 , wherein
- said exposing said dielectric film to said C_xH_y containing material comprises introducing said C_xH_y containing material within a liquid phase or a supercritical phase.